

Math 110 Section 17

Quiz 1

Name _____

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Instructor: Charles Cuell

Student Number _____

All solutions are to be presented on the paper in the space provided. The quiz is open book. You can discuss the problem with others and ask the TA questions.

- (1) Rewrite the following expression without absolute values: $|4 - x^2|$
The definition of absolute value gives:

$$|4 - x^2| = \begin{cases} 4 - x^2 & \text{when } 4 - x^2 \geq 0 \\ -(4 - x^2) & \text{when } 4 - x^2 < 0 \end{cases}$$

Need to simplify by solving the inequalities on the right hand side.

$$\begin{aligned} (4 - x^2) &\geq 0 \\ (2 - x)(2 + x) &\geq 0 \end{aligned}$$

Use a sign table:

	$x < -2$	$-2 < x < 2$	$x > 2$
$(2 - x)$	+	+	-
$(2 + x)$	-	+	+
$(2 - x)(2 + x)$	-	+	-

So, the expression is

$$|4 - x^2| = \begin{cases} -(4 - x^2) & x < -2 \\ 4 - x^2 & -2 \leq x \leq 2 \\ -(4 - x^2) & x > 2 \end{cases}$$

- (2) Write the equation of the line that goes through the point $(-1, 6)$ and is parallel to the x axis.

The equation of the x axis is $y = 0$. So the slope of the line we want is $m = 0$. Therefore, the equation of the line is

$$y = 6$$